

## STUDIES IN AMERICAN SPIDERS: MISCELLANEOUS GENERA OF ERIGONEÆ

## PART I

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For a number of years we have been studying the American species of Erigoneæ with the object of placing them in natural genera. In former papers we have considered those species that can be grouped into fairly well-defined and distinct genera each containing a considerable number of species differing from each other only in minor characters; Ceraticelus, Grammonota, Ceratinopsis, Erigone and Eperigone are good examples. We now come to a long series of more or less isolated species which seem to represent all that is left of separate lines of development. Numerous small genera are required for their reception, each containing only one or two species. It is quite likely that additional members of these small genera will be found in other parts of the world. With this possibility in view we have studied a large series of species from Europe, but in many cases without finding any close relatives. The spider fauna of Siberia and eastern China is still very imperfectly known and it is probable that the nearest relatives of many of our American forms will be found there. For exotic material we are indebted to Lucian Berland and Louis Fage of Paris, to Mr. A. Holm of Sweden, to Dr. E. Hesse of Berlin, to Dr. E. Schenkel of Basel, to Fen Hsueh of Tientsin, China, and to S. A. Spassky of Novotcherkassk, Russia. We are especially indebted to Dr. A. Randell Jackson of England for specimens and for comparing American material with specimens of rare species from Europe and elsewhere.

Most of the drawings were made by Miss Helen M. Zorsch; a few by Mr. Albert W. Force.

**Coreorgonal** new genus

Type, *Delorhipis bicornis* Emerton.

The male has the head armed with a clypeal horn, slender in *monocerus* and thickened in *bicornis*. In *bicornis* the anterior median eyes are borne on the

tip of a stout cephalic horn. The embolic division is of the spiral type. The patella of the male palpus is long and enlarged ventrally. The tibia is very short, armed dorsolaterally with a long process of characteristic form and dorsolaterally with a long stout spine.

Both species have been placed in *Delorrhapis* with which they have little in common. In *fronticornis*, the type of that genus the tibia, the embolic division and the median apophysis are of an entirely different type.

### Coreorgonal bicornis Emerton

(Figures 1-4)

*Delorrhapis bicornis* Emerton, Can. Ent. 55: 242, fig. 7. 1923.

Male. Length, 2.5 mm. Cephalothorax dark yellow-orange, a band across head between the lateral eyes and the horns yellow; viewed from above evenly rounded on the sides to the lateral eyes without any constriction at the cervical groove. The upper horn, which bears the posterior eyes on its base and the anterior median eyes on the tip, rather stout, bluntly rounded at tip, gently and broadly constricted beyond the eyes, and clothed with numerous short stiff hairs, dusky at tip; the upturned tip of the lower horn visible in front of the upper horn. Cephalothorax viewed from the side arched over the back to the cervical groove where there is a broad shallow depression, then gently rounded over the head to the base of the upper horn. The lower horn arising from the lower half of the clypeus, the distal half greatly swollen, upturned, and clothed with hairs directed upward; the opening between the two horns nearly circular. Sternum very dark gray over orange. Endites pale. Legs orange. Abdomen greenish gray.

Posterior eyes in a recurved line, the median smaller than the lateral, close together on the base of the upper horn, separated by the diameter and from the lateral by a little more than twice the diameter. The anterior median eyes close together on the tip of the upper horn, widely distant from the lateral.

Femur of palpus stout, nearly cylindrical. Patella long, slender at base, greatly swollen ventrolaterally, clothed dorsally with numerous dark stiff hairs, the mesal angle deeply excavated for the insertion of the tibia, where a white, spherical enlargement of the intersegmental membrane is evident. Tibia with the base

cylindrical, armed dorsally with large stiff black spine and mesally with a long thin process, which ends in a sharp black hook, and has a blunt tooth on the mesal margin. Cymbium strongly convex, truncate at apex with a distinct groove opposite the paracymbium. Paracymbium with a broad base which bears the rather stout hooked terminal part. Bezel narrow and very high, the duct showing distinctly. The embolic division consists of a spirally coiled, grooved tail-piece and a black embolus similarly coiled, the terminal turn the largest. The entire palpus is very much like that of *Coreorgonal monoceros*.

Type locality: Terrace, British Columbia.

Redescribed from 1 ♂ from the type lot, given us by Mr. Emerton.

### *Coreorgonal monoceros* Simon

(Figures 5-8)

*Delorrrhipis monoceros* Simon, Ar. Fr. 5: 697, fig. 554. 1884.

*Erigone monoceros* Keyserling, Spinn. Am. Therid. 2: 156, pl. 16, fig. 222. 1886.

*Delorrrhipis monoceros* Simon, Hist. Nat. Ar. 1: 617, f. 668, 1894.

Male. Length, 2.3 mm. Cephalothorax yellowish strongly suffused with dusky, narrowly black at margin, cephalic lobe lighter. Cephalothorax viewed from above very broad, evenly rounded on the sides to the cervical groove, then strongly converging in a straight line to the truncate, gently convex front. Cephalic lobe rounded behind, bluntly pointed in front. The clypeal horn of nearly the same width throughout. Cephalothorax viewed from the side, low behind, gently convex to the base of the cephalic lobe, then abruptly elevated and rounded over the back of the head to the anterior median eyes. Median ocular area clothed with stiff hairs curving forward. Clypeus very broad, slightly convex and slightly protruding, bearing the horn about its diameter from the margin. The horn nearly cylindrical, bent upward a little at base and slanting upward and forward, clothed at tip with a few small hairs directed backward.

Sternum smooth and shining, yellow under a black reticulation, black at margin. Endites yellow suffused with gray. Legs and palpi pale yellow. Abdomen black.

Posterior eyes in a recurved line, the median slightly oval, separated by a little less than twice the short diameter, and from the lateral by three times the diameter. Anterior eyes in a slightly procurved line, the median smaller than the lateral, separated by a little less than the diameter and from the lateral by five times the diameter.

Femur of palpus compressed, armed at base on the inner side with a rounded tubercle bearing the stridulating cusp. Patella very long, strongly swollen towards the tip, depressed just back of the dorsomesal margin, clothed dorsally with many stiff hairs, the tip hollowed out for the insertion of the tibia. Tibia very short, armed dorsolaterally with a stout straight sharp-pointed spine and dorsomesally with a long, thin, slender process which is armed on the mesal side with a blunt tooth; the tip is black and strongly hooked. The paracymbium armed at base with a row of long stiff hairs, thin and flat, broad at base, the tip strongly hooked with a broad rounded notch on the inner side. Tail-piece very long, grooved and spirally coiled. The embolus a long black style, in a spiral coil of more than two turns, the outer one the larger.

Type locality: Washington Territory.

Washington: Paradise Camp, Mt. Rainier, near snow, Aug. 19, 1927. 1 ♂.

Oregon: Tellamook Co., Aug. 20, 1931, 1 ♂ (Macy).

#### **Gnathonagrus** new genus

Type: *Tmeticus unicorn* Banks.

Very closely related to *Gnathonarium* from which it differs in having a well-developed clypeal horn in the male. The embolus does not pass back of the bulb but remains on the mesal side. There is no tooth on the face of the chelicerae.

#### **Gnathonagrus unicorn** Banks

(Figures 9-13)

*Tmeticus unicorn* Banks, Phila. Acad. Nat. Sci. Proc. 1892, p. 38, pl. 4, fig. 13.

*Delorhipis monoceros* Simon, Hist. Nat. Ar. 1: 620, 1894.

*Delorhipis unicornis* Crosby, Phila. Acad. Nat. Sci., 1905, p. 328, pl. 29, fig. 4.

*Delorrihyps unicorn* Banks, Phila. Acad. Nat. Sci. Proc. 1916, p. 74.

Male. Length, 1.4 mm. Cephalothorax orange-yellow, lightly suffused with dusky, darker at the margin; viewed from above, evenly and broadly rounded on the sides without any constriction at the cervical groove, the sides strongly convergent towards the front, bluntly rounded across the front. The clypeal horn long and slender, constricted in the basal half. Cephalothorax viewed from the side rather steeply ascending in a straight line to the cervical groove where there is a distinct depression, rounded over the cephalic lobe to the posterior median eyes. Clypeus hollowed out below the eyes, the clypeal horn slants upward so that its tip is on a level with the lateral eyes. Below the horn the clypeus is slightly concave and protruding. Sternum gray with scattered yellow flecks, broad, strongly convex, broadly produced between the hind coxæ which are separated by a little more than the diameter. Endites orange-yellow. Legs yellow. Abdomen light gray.

Posterior eyes in a straight line, the median a little larger than the lateral, separated by a little less than the diameter and from the lateral by the radius. Anterior eyes in a procurved line, the median very much smaller than the lateral, equidistant, separated by the radius.

Femur of palpus long, cylindrical, slightly curved inward, armed above on the median line with a row of 7 or 8 curved hairs. Patella viewed from above slightly constricted in the middle. Ratio of length of femur to that of patella as 20 to 12. Tibia ventrally very short, dorsally armed on the mesal angle with a short triangular black tooth and in the middle of the mesal side with a similar pale tooth. The lateral angle produced into a very long process which is curved mesally and ventrally; there is on the under side, on the basal third, a low hump. The cymbium armed dorsally on the basal third with a single row of short stiff hairs increasing in length distally. Paracymbium thin, nearly flat, tip broadly rounded with a shallow notch. The embolus arises from a thin irregular tail-piece that extends out on the ventral side of the bulb, curves along the mesal side to the base, then along the lateral side, across the tip, across the face of the

bulb, the tip lying between the tip of the cymbium and a broad dark process thickened along each side.

Female. Length, 1.5 mm. Similar to male. Head normal. Posterior eyes in a straight line, equal, the median separated by the diameter and from the lateral by the radius. Anterior eyes in a procurved line, the median much smaller than the lateral, separated by the diameter and from the lateral by a little less. The epigynum a convex, semicircular plate, the middle lobe triangular, narrower in front, the posterior margin crenulate.

Type locality: Six Mile Creek, Ithaca, N. Y.

New York: Crosby, April, 1904, 1 ♂; Ithaca, March, 1904, 2 ♂ 4 ♀; Barrington, Oct. 27, 1918, 1 ♂.

### GNATHONARIUM Karsch

Arch. Naturg. 47: 10. 1881.

Type: *Gnathonarium rolfsianum* Karsch which equals *Theridion dentatum* Wider.

This genus is characterized by the structure of the genital bulb of the male palpus. We give a description and figures of the type species.

### *Gnathonarium dentatum* Wider

(Figures 14–16)

*Theridion dentatum* Wider, Zool. Misc. Ar. p. 223. 1834.

*Argus dentatus* Walckenaer, Ins. Apt. 2: 345. 1841.

*Erigone dentata* Westring, Ar. Suec. p. 262, 1861.

*Neriene dentata* Blackwall, Spid. Gt. Brit. p. 258, pl. 18, f. 174. 1864.

*Tmeticus dentatus* Menge, Preuss. Spinn., p. 187, pl. 35, f. 87. 1868.

*Tmeticus cristatus* Menge, Preuss. Spinn., p. 189, pl. 36, f. 88. 1868.

*Erigone taczanowskii* Cambridge, Zool. Soc. Lond. Proc. 1873, p. 444, pl. 41, f. 10.

*Neriene dentata* Cambridge, Spid. Dorset, p. 115. 1879–81.

*Gnathonarium rolfsianum* Karsch, Arach. Naturg. 47: 10, pl. 1, fig. 7. 1881.

- Gongylidium dentatum* Simon, Ar. Fr. 5: 492, f. 276-279. 1884.  
*Trachygnatha dentata* Chyzer & Kulczynski, Ar. Hung. 2: 91,  
pl. 3, f. 41. 1894.  
*Gongylidium dentatum* Müller & Schenkel, Naturf. Ges. Basel.  
Verh. 10: 736. 1895.  
*Edothorax dentatus* de Lessert, Rev. Suisse Zool. 12: 327. 1904.  
*Edothorax exsiccatus* Bösenburg and Strand. Jap. Spin., p. 166,  
pl. 12, f. 265, 1906.  
*Edothorax dentatus* de Lessert, Rev. Suisse, Zool. 15: 96. 1907.  
*Edothorax dentatus* de Lessert, Cat. Ar. Suisse, p. 194. 1910.  
*Gnathonarium dentatum* Simon, Ar. Fr. 6: 476. 1926.

Male. Length, 2 mm. Cephalothorax orange-red, viewed from above evenly rounded on the sides, narrowed forward and gently constricted at the cervical groove, eyes in profile; viewed from the side, steeply ascending behind, then more gradually to the back of the head with a slight depression at the cervical groove, nearly level on top of head. Clypeus slightly concave and retreating. Sternum dusky over reddish orange, darker at edge. Endites pale towards tip, armed on the side with many setigerous tubercles. Chelicerae armed with a large tooth on the face and a group of small teeth on the anteriolateral face. Legs long, pale orange-yellow. Abdomen light gray, with a tinge of red, blackish at tip. In specimens from France the stripe on the abdomen, especially in the female, is more distinct than in those from China.

Femur of palpus nearly straight, armed on the mesal side with a series of 9 or 10 setigerous tubercles more widely separated distally. Patella long and stout, widened distally, the tip angulate ventro-laterally, armed laterally with a series of 7 long slender curved hairs and on the mesal side near the base with 3 or 4 long hairs. Ratio of length of femur to that of patella as 26 to 19. Tibia not greatly widened distally, armed on the lateral angle with a very long apophysis which is gradually narrowed distally and armed mesally with a small triangular tooth, the tip of the process sharp and incurved. The terminal part of the paracymbium flat, nearly quadrate, with a deep rounded notch before the tip. The tegulum and subtegulum very narrow; the embolus arises from a geminated bulb near the base of the cymbium and passes immediately under the mesal edge of the

latter, proximad to the attachment of the bulb to the alveolus, emerging on the opposite side from beneath the paracymbium and then curves up along the face of the bulb, the very slender tip lying within a sheath the tip of which is pointed and extends beyond the edge of the cymbium.

Female. Length, 2 mm. Similar to the male in form and color but the abdomen has an indistinct light stripe, more pronounced in specimens from France. The setigerous tubercles on the chelicerae less developed, the large tooth lacking. The epigynum is a transverse, convex plate, with a small triangular notch in the hind margin, the receptacles show through as two circular dark areas separated by about the diameter.

Type locality: Ginster, near Beerfelden.

France: 4 ♂ 1 ♀, Simon det.

Tripoli: Ain Schersozura, 1 ♂, type of *Gnathonarium rohlfsianum* Karsch, kindly lent us by Dr. E. Hesse, of the Zoological Museum of the University of Berlin.

China: Peiping, Sept. 15, 1925, 1 ♂ (P. W. Claassen); Tien Tsin, 1 ♂ 2 ♀ (Fen Hsueh).

### ***Gnathonarium famelicum* Keyserling**

(Figures 17-18)

*Erigone famelica* Keyserling, Spinn. Am. Therid. 2: 186, pl. 17, f. 246. 1886.

*Erigone famelica* Banks, Wash. Acad. Sci. Proc. 2: 480, pl. 29, f. 7-8. 1900.

*Gongylidium columbianum* Emerton, Can. Ent. 55: 238, f. 2. 1923.

Male. Length, 2.6 mm. Cephalothorax bright chestnut brown, head darker, viewed from above, broadly and evenly rounded on the sides to the cervical groove, then gently converging to the bluntly rounded front; viewed from the side, rather low, moderately ascending behind to the cervical groove where there is a slight depression, then evenly and broadly rounded over the head to the posterior eyes. Clypeus straight and retreating. Chelicerae large, swollen at base, armed on the face with a very large tooth and in front and on the side with many small tubercles. Sternum gray over chestnut, margin scalloped, rather pointed



behind. Endites orange-yellow. Legs orange. Abdomen dark grey.

Posterior eyes in a straight line, equal, the median oval, separated by the long diameter, and from the lateral by a little less. Anterior eyes in a very slightly procurved line, the median smaller than the lateral, separated by the radius and from the lateral by a little less than the diameter.

Femur of palpus rather long, slender, only moderately curved, armed on the mesal side with a row of small setigerous tubercles mostly confined to the basal half. Patella nearly straight, greatly widened distally, the lateral angle produced into a large blunt tooth. Tibia gradually widened on the mesal side, nearly straight on the lateral side, armed dorsolaterally with a long, stout apophysis the tip of which is smooth and black and curved mesally, the mesal side of this process armed with a small black triangular tooth. Ratio of length of femur to that of patella as 5 to 3.

Paracymbium almost square in outline with a very deep rounded notch on the side next to the cymbium. The embolus arises from a geminate bulb, curves across the mesal side of the bulb, passes under the cymbium to emerge on the other side at the base of the paracymbium, it then passes up across the face of the bulb in a broad, deep groove in what seems to be an enormously developed bezel. The terminal part of the embolus is extremely fine and hair-like.

Type locality: Sitka, Alaska.

British Columbia, Terrace, 1920 (the type of *Gongylidium columbianum* Em.).

The type of *Gongylidium columbianum* Em. is much larger than specimens of *dentatum* from China. We have not been able to compare specimens but Miss Elizabeth B. Bryant did so for us. She writes as follows: "The most striking difference is the size, as the Chinese specimen is about one half as large as the American species. These are the differences as I found them—*Gongylidium columbianum*, maxillæ and base of palpus smooth, femur of palpus with granules, patella  $\frac{1}{2}$  length of femur, plainly concave below, and broadest at tip, ventral tooth at tip as long as diameter of patella at base (in Mr. Emerton's drawing the

patella is lengthened and the tooth foreshortened), tibial apophysis abruptly constricted at tip and ending in a long sharp curved point which rests in a depression of the cymbium. The palpal organs are very similar, the conductor ending in a more slender tip than Mr. Emerton figures.''

#### TMETICUS Menge

Preuss. Spinnen, p. 184, 1866.

Type: *Tmeticus leptocaulis* Menge, which equals *Neriene affinis* Blackwall.

In this genus the tibia of the male palpus is relatively long and without a process. In the type species there are two small teeth on the outer distal angle. The patella is long and bears a distinct process on the under side at tip. In both species the embolic division has a nearly flat tail-piece and ends in two points, the duct opening in the one nearest the tip of the cymbium.

In this genus we place only one American species, *Gongylidium ornatus* Emerton.

#### *Tmeticus affinis* Blackwall

(Figures 19-21)

*Neriene affinis* Blackwall. Ann. Mag. Nat. Hist. (Ser. 2) 16: 121. 1835.

*Neriene affinis* Blackwall. Spid. Gt. Grit., p. 259, pl. 18, fig. 175. 1864.

*Tmeticus leptocaulis* Menge. Preuss Spinn., p. 185, pl. 35, Tab. 85. 1868.

*Erigone affinis* Thorell. Remarks on Synonyms, pp. 127, 444. 1871 and 1873.

*Tmeticus affinis* Bösenberg. Spinn. Deutschl., p. 165, pl. 14, fig. 223. 1903.

*Anglia hancockii* Smith. Quekett Micr. Club Jour. (Ser. 2) 9: 247, pl. 16. 1905.

*Tmeticus affinis* Simon. Ar. Fr. 6: 521. 1926.

Male. Length, 2.5 mm. Cephalothorax dull orange, suffused with dusky along the radiating lines; viewed from above broad, evenly rounded on the sides to the cervical groove where there is

a broad shallow depression, broadly rounded across the front; viewed from the side gently arched over the back to the eyes, with a very slight depression at the cervical groove, highest back of the eyes. Clypeus gently concave, slanting moderately forward. Sternum short and broad, convex, dark gray over orange. Endites thickened, armed with numerous setigerous tubercles, the one on the outer distal angle distinct. Chelicerae robust, armed on the inner edge with a large tooth and on the face with numerous setigerous tubercles. Legs orange, abdomen dark gray with a broad pale band on the venter. Posterior eyes in a slightly procurved line, the median slightly smaller than the lateral, separated by the diameter and from the lateral by a little less. Anterior eyes in a straight line, the median slightly smaller than the lateral, equidistant, separated by the radius. Femur of palpus moderately stout, curved inward and downward. Patella slender at base, thickened at tip with a stout triangular tooth below. Ratio of length of femur to that of patella as 26 to 16. Tibia long, slender at base, gradually thickened distally, the dorsal margin nearly straight across, armed dorsolaterally with two small black teeth some distance from the true margin from which they are separated by a shallow excavation. Cymbium small. Paracymbium very broad at base, armed with a row of 6 or 7 short stiff hairs, the distal part strongly curved with deep narrow notch. Tegulum strongly developed with a high bezel. The embolic division is broad and flat with a rounded tail-piece at one end and with the other ending in two points, the lateral one triangular and the other longer and curved; the latter is the embolus.

Described from 2♂ from Sussex, England. (A. Randell Jackson.)

#### *Tmeticus ornatus* Emerton

(Figures 22-26)

*Gongylidium ornatus* Emerton. N. Y. Ent. Soc. Jour. 22: 263, pl. 8, fig. 3. 1914.

*Male.* Length, 3.8 mm. Cephalothorax bright orange, the entire head very dark brown, almost black; viewed from above, sides evenly rounded to the cervical groove, then parallel on the

sides of the head, broadly rounded in front; viewed from the side rather flat, gently arched over the back to the eyes. Clypeus straight and vertical.

Posterior eyes in a straight line, equal, separated by the diameter. Anterior eyes in a straight line, median smaller than the lateral, separated from each other and from the lateral by the radius. Clypeus about as wide as median ocular area. Chelicerae dark brown, swollen, fusiform, divergent, armed with a large tooth on the face, denticulate on the sides, the claw very large, sinuous and strongly curved. Upper margin of the furrow of the chelicera armed with a row of small teeth, three close together at the inner angle, and three more widely separated towards the base of the claw; the lower margin armed with four large teeth, the two nearest the base of the claw near together, the others somewhat separated. Sternum dusky orange, darker at the margin, broad, convex, strongly rounded on the sides and produced in a blunt process between the hind coxae which are separated by a little more than half the diameter. Labium and endites darker than sternum. Legs and palpi bright orange. Trochanters of first and second legs strongly protuberant ventrally; others less so. Abdomen dark gray, almost black.

Trochanter of palpus strongly protuberant ventrally. Femur long, slender, strongly curved. Patella long, arched above, swollen distally and armed ventrally with a large apophysis. Ratio of length of femur to that of patella as 26 to 13. Tibia a little longer than patella, widened distally. Dorsolateral margin of tibia armed with two short teeth, the outer one rounded, the inner one bluntly pointed. Paracymbium very broad at base, where it is armed with two or three short spines; strongly curved and with a short hook at the tip. Bezel very high. The embolic division is a modification of the *Erigone* type. The posterior tooth is long and pointed, the median tooth is entirely lacking and the embolus representing the anterior tooth is long and slender. The mesal projection is larger with a rounded margin, the mesal tooth lacking.

Female. Length, 3.5 to 4 mm. Colored as in the male. Chelicerae large, divergent and finely denticulate on the sides but without a tooth on the face. Upper margin of the furrow of the

chelicera armed with three large and one small tooth evenly spaced; lower margin armed with four evenly spaced smaller teeth. Epigynum a broad transverse, slightly convex plate straight behind; the median fovea is semicircular but the middle lobe is truncate wedge-shaped.

Type locality: Ithaca, N. Y.

New York: Ithaca, Mar. 11, 1916, 2♂ 3♀ on cattail tops. (P. W. Claassen); also in Sept. Crusoe Lake, Wayne Co., May 17, 1919, 1♀; Montauk Pt., May 24, 1924, 1♀.

#### NANAVIA Chamberlin and Ivie

Bul. Univ. Utah, 23: 26. 1933.

Type: *Nanavia monticola* Chamberlin and Ivie.

This genus is very closely related to *Tmeticus* in the form of the embolic division of the genital bulb and in the form and armature of the tibia but differs in lacking a process on the tip of the patella.

In *Erigone* (*Tmeticus*) *tenuipalpis* Emerton, which Chamberlin and Ivie place tentatively in *Nanavia*, the embolic division has advanced much further towards the typical *Erigone* form and we, therefore, leave it in that genus as a transitional species.

#### *Nanavia monticola* Chamberlin and Ivie

(Figures 27-28)

*Nanavia monticola* Chamberlin and Ivie, Bul. Univ. Utah 23: 27, pl. 8, f. 75-82. 1933.

Male. Length, 3 mm. Cephalothorax orange yellow suffused with dusky, darker along the radiating lines; viewed from above, evenly and broadly rounded on the sides to the cervical groove where there is a slight constriction then gradually converging to the broadly truncated front; viewed from the side rather low, gently ascending behind to the cervical groove where there is a shallow depression, then broadly and evenly rounded over the head to the posterior eyes; a median row of stiff hairs directed forward. Clypeus nearly straight and slightly protruding. Sternum orange strongly suffused with dusky, darker at the margin, pointed behind. Endites dusky at base, lighter distally.

Legs orange. Abdomen dark gray, light in front with a herring-bone light pattern behind.

Posterior eyes in a straight line, equal, the median separated by the radius and a little farther from the lateral. Anterior eyes in a straight line, the median much smaller than the lateral, separated by less than the radius and from the lateral by the radius.

Femur and palpus rather long and slender, gently curved inward. Patella moderately short, strongly curved. Ratio of length of femur to that of patella as 38 to 17. Tibia long, nearly cylindrical, slender at base, gradually and evenly widened distally. The distal margin nearly straight all way round, dorso-laterally there is a very short, broad, black-edged lobe with a finely serrate margin. Cymbium short, convex dorsally. Paracymbium very broad at base; armed on the margin next to the tibia with a row of nine or ten short stiff hairs; the distal part bent squarely back along the basal part from which it is separated by a narrow fissure. The bulb is rather small. The tail-piece of the embolic division is a thin, nearly flat plate, the central part of which is quadrate with a narrow part that extends to the edge of the cymbium. The embolus is the middle one of three teeth, the one lying mesally from it is shorter and the lateral one longer.

Type locality: Clear Creek, Raft River Mts., Utah.

Utah: Salt Lake City, Sept., 1930, 1 ♂ (Gertsch).

#### MASO Simon

Ar. Fr. 5: 861. 1884.

Type: *Erigone sundevalli* Westring.

In the type species the female has the tarsi and metatarsi of the first and second legs armed below with two rows of long divergent spines; in the male they are not conspicuously developed. The embolic division has a distinct tail-piece which gives rise, in the interior of the bulb to a long style-like embolus which emerges on the mesal side of the bezel and then curves around to the distal end of the bulb.

**Maso alticeps** Emerton

(Figures 29-32)

*Caseola alticeps* Emerton, Conn. Acad. Sci. Trans. 14: 187, pl. 2, f. 2. 1909.

Male. Length, 1.5 mm. Cephalothorax dull yellowish strongly suffused with gray, darker along the radiating lines and with dark patch back of the head, pointed behind. Cephalothorax viewed from above very broad, evenly rounded on the sides behind, very strongly narrowed towards the front, the head carried forward so that the anterior eyes are in profile; viewed from the side moderately ascending behind to the cervical groove, then nearly flat for a short distance, steeply ascending on the back of the head to the posterior eyes, median ocular area slanting forward in a straight line. Clypeus concave and nearly vertical. Sternum dark, broad, convex, smooth and shining. Endites pale. Legs pale dusky orange yellow, somewhat hairy. Abdomen gray.

Posterior eyes in a straight line, equal, the median separated by the diameter and a little farther from the lateral. Anterior eyes in a slightly procurved line, the median smaller than the lateral, separated by the radius and from the lateral by a little more.

Femur of palpus moderately long, curved inward. Patella short and stout. Ratio of length of femur to that of patella as 17 to 6. Tibia short and stout with a keel-like protuberance below, the dorsal margin broad with a broad, triangular projection in the middle, tip sharply inflexed; the mesal side finely dentate, the lateral angle of the tibia a broad triangular tooth. Paracymbium of moderate size strongly curved, hooked at tip. Tegulum narrow. Tail-piece of the embolic division small, rounded-triangular and lying flush with the edge of the tegulum. It gives rise in the interior of the bulb to a long, slender, style-like embolus which ascends in an open spiral, the tip protected by a large broad, lamellate conductor and by another more slender process which ends in a minute black tooth.

Type locality: Three Mile Island, Lake Winnepesaukee, N. H. Maine: Winterport, Aug. 29, 1925, 1 ♂.

New Hampshire: Intervale, July 17, 1913, 1 ♂ (Bryant).

Emerton also recorded the species from Waltham, Mass.

**Maso sarcocuon** Crosby and Bishop

(Text figure 1)

*Oedothorax sarcocuon* Crosby and Bishop. N. Y. Ent. Soc. Jour. 35: 149, pl. 15, fig. 8-10. 1927.

In the structure of the palpal organ this species is closely related to *alticeps*. The male may be easily recognized by the transverse groove below the anterior eyes.

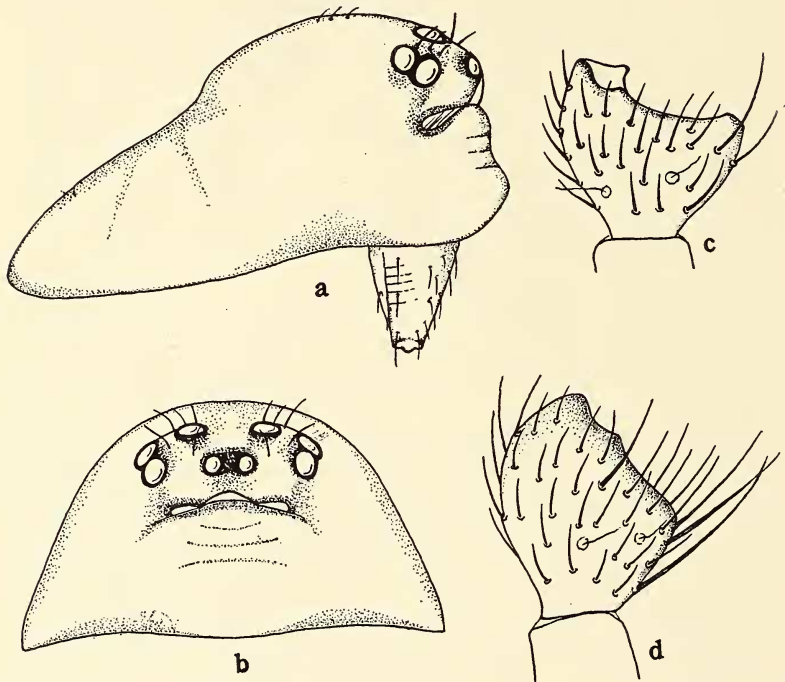


FIGURE 1. *Maso sarcocuon*: a. cephalothorax, lateral view; b. same, anterior view; c. tibia of male palpus, dorsolateral view; d. same, dorsal view.

**Maso polita** Banks

(Figures 33-34)

*Maso polita* Banks, Am. Ent. Soc. Trans. 23: 67. 1896.

Male. Length 1.8 mm. Cephalothorax brown, lighter on the front. Viewed from the side the cephalothorax ascends in



a nearly straight line to the cervical groove where there is a slight depression. The clypeus is very wide, slightly convex and strongly retreating. The head is very broad and square, the lateral eyes occupying the angles. The posterior eyes in a procurved line, the median being smaller and farther from the lateral than from each other. Anterior eyes in a slightly procurved line, the median smaller than the lateral, close together and farther from the lateral. The ocular area and the space between and back of the posterior median eyes densely clothed with short, stiff, erect hairs.

Sternum light brown, rounded between the posterior coxæ. Labium dark, endites pale, legs and palpi light brownish yellow. Abdomen yellowish, grayish at tip. Legs bristly, with two rows of spines on the under side of tibiæ and metatarsi.

Tibia of palpus short, bearing a short acute dorsal apophysis and a blunter one on the outer angle. The median apophysis very strongly developed, coiled in a spiral (visible only in expanded preparation) and terminates in a strongly chitinized point at the apex of the palpal organ.

The embolic division consists of a short flat tail-piece only a small part of which is visible in the unexpanded palpus; the embolus arises from the basal part at a right angle. It is slender and simply curved; the tip lies near the end of the median apophysis and is protected by a membranous conductor.

Female. Similar to male in coloration. The legs are much more spiny, especially the first and second pairs. The head is normal. The posterior eyes are in a straight line, nearly equidistant. Anterior row gently procurved.

Type locality: Washington, District of Columbia.

Described from the type, 2 ♂ and 3 ♀.

### Maso sundevalli Westring

(Figures 35-37)

*Erigone sundevallii* Westring, Götheb. Vet. Vit. Samh. Handl. 2: 44. 1851.

*Erigone sundevallii* Westring, Ar. Suec. p. 290. 1861.

*Microneta sundevallii* Menge, Preuss. Spin. p. 232, pl. 45, f. 131. 1869.

- Erigone sundevallii* Thorell, Rem. Syn. p. 142. 1871.  
*Erigone sundevallii* Cambridge, Linn. Soc. Lond. Trans. 27: 450. 1871.  
*Erigone westringi* Simon, Soc. Zool. Fr. Bul. 6: 258. 1881.  
*Neriene sundevallii* Cambridge, Spid. Dorset p. 125. 1879.  
*Maso westringi* Simon, Ar. Fr. 5: 864, f. 800. 1884.  
*Phylloeca sundevalli* Dahl, Naturw. Ver. Schlesw.-Holst. Schriften 6: 101. 1886.  
*Ceratinopsis frontata* Banks, Phila. Ac. Sci. Proc. 1892, p. 33, pl. 5, f. 63.  
*Maso sundevalli* Chyzer and Kulezynski, Ar. Hung. 2: 133, pl. 5, f. 15. 1894.  
*Maso sundevalli* Simon, Hist. Nat. Ar. 1: 641. 1894.  
*Maso westringi* Müller and Schenkel, Naturf. Ges. Basel Verh. 10: 744. 1895.  
*Maso frontata* Banks, Am. Ent. Soc. Trans. 23: 67. 1896.  
*Maso sundevalli* Bösenberg, Spin. Deutschl. p. 154, pl. 13, f. 207. 1903.  
*Maso sundevalli* de Lessert, Rev. Suisse Zool. 12: 332. 1904.  
*Maso frontata* Crosby, Phila. Ac. Sci. Proc. 1905, p. 341.  
*Maso sundevalli* de Lessert, Rev. Suisse Zool. 15: 96, 111. 1907.  
*Caseola herbicola* Emerton, Conn. Ac. Sci. Trans. 14: 186, pl. 2, f. 1. 1909.  
*Maso sundevalli* de Lessert, Cat. Ar. Suisse p. 207. 1910.  
*Maso frontata* Banks, Phila. Acad. Sci. Proc. 1911, p. 447, pl. 35, f. 17.  
*Maso sundevalli* Falconer, Naturalist, June 1910, p. 229, f. 2, 3.  
*Maso sundevalli* Simon, Ar. Fr. 6: 328, f. 548-549. 1926.

Male. Length, 1.5 mm. Cephalothorax light brown, darker on the head, viewed from above evenly rounded on the sides with a very slight constriction at the cervical groove and with the eyes in profile; viewed from the side, rather steeply ascending behind to the cervical groove, then more gradually ascending and broadly rounded over the head to the posterior median eyes. Clypeus nearly straight and slightly protruding. Sternum light gray over dull yellow, darker at the margin, moderately broad and convex, produced behind between the hind coxæ, which are separated by the diameter. Labium and endites dusky yellow.

Legs orange-yellow. A double row of stiff hairs on the under-side of the first and second legs.

Posterior eyes in a straight line, the median slightly smaller than the lateral, separated by the diameter and a little farther from the lateral. Anterior eyes in a very slightly procurved line, the median smaller than the lateral, separated by the diameter and from the lateral by nearly twice the diameter.

Femur of palpus moderately long and slender, nearly straight, armed laterally with a row of 4 hairs increasing in length distally. Patella short and thick. Ratio of length of femur to that of patella as 20 to 7. Tibia obconic, the dorsal margin thin, evenly and broadly rounded, just back of the margin, a transverse, curved, ridge with a very finely serrated margin. Lateral angle of tibia evenly and broadly rounded without any excavation. Paracymbium rather stout, strongly curved, only slightly hooked at tip. Tegulum strongly developed, protuberant ventrally, the bezel high, whitish. Tail-piece of the embolic division rather small, bulb-like, lying over the edge of the tegulum, it gives rise immediately to a long, black, whip-like embolus which first passes into the interior of the bulb, emerges from beneath the edge of the bezel and curves distally along the mesal side of the bulb, the tip protected by a membranous conductor and lies near the median apophysis which appears as a stout, black process.

Female. Length, 1.7 mm. Similar to the male in form and color. The abdomen pale, often with a dusky area on the front. The spines on the under side of the first and second legs are larger than in the male. The epigynum has the middle lobe broad and quadrate, in front of which there are two strong, curved ridges. The receptacles show through the integument as black spots.

Our supposition that this American spider is identical with *Maso sundevalli* of Europe has been confirmed by Doctor A. Randell Jackson, to whom we submitted specimens for comparison.

Type locality: Götheborg, Sweden.

Massachusetts: Chester, May 14, 1933, 1 ♀.

Minnesota: Lake Minnetonka, June 22, 1926, 1 ♀ (Fletcher).

New York: Ceres, Sept. 16, 1925, 1 ♀; Deruyter Lake, July 4, 1922, 1 ♂ 1 ♀; Enfield Glen, Oct. 12, 1924, 1 ♀; Guyanoga, June 24, 1923, 2 ♂ 1 ♀; Interlaken, July 1904, 5 ♀; Ithaca, Oct. 8, 1922, 2 ♀; May 23, 1911, 1 ♀ (Banks); July, 2 ♀; Labrador Pond, June 7, 1921, 1 ♀; Letchworth Park, July 9, 1922, 2 ♀; Long Pond, Suffolk Co., June 29, 1924, 1 ♀; McLean, July 1904, 1 ♀; July 4, 1924, 1 ♀; Mendon, Oct. 14, 1924, 2 ♀; Olcott, Sept. 1922, 1 ♀ (Dietrich); Potter Swamp, Yates Co., July 16, 1926, 1 ♀; Presho, Oct. 29, 1924, 1 ♀; Rock City, Sept. 16, 1925, 1 ♀; Slaterville, May 10, 1925, 1 ♀; Snyder Lake, June 18, 1930, 2 ♂ 2 ♀; Stamford, May 30, 1921, 2 ♀ (Chrisp); Oct. 21, 1924, 2 ♀; Sylvan Beach, July 1904, 1 ♀; West Kilns, June 28, 1931, 1 ♂; Wilmington Notch, Aug. 21, 1916, 4 ♀; Aug. 26, 1921, 2 ♀.

North Carolina: Aquone, Oct. 16, 1926, 1 ♀; Black Mt., several ♂ and ♀; Blowing Rock, Oct. 10, 1923, 1 ♀; Junalaska Gap, Oct. 17, 1926, 1 ♀; Minehole Gap, Buncombe Co., Oct. 12, 1923, 1 ♀; Mt. Pisgah, Oct. 19, 1923, 5 ♀; Nantahala Gap, Oct. 16, 1926, 1 ♀.

Tennessee: Laurel Creek, Sevier Co., Oct. 8, 1926, 2 ♀.

Vermont: Pittsford, May 8, 1929, 1 ♀; South Newfane, July 4, 1931, 1 ♂ (Bryant); June 1929, 1 ♀.

England: Surrey, 2 ♂ 3 ♀ (Hancock).

Hungary: 1 ♂ 2 ♀ (Kulezynski).

France, 1 ♂ 1 ♀ (Simon).

#### UTOPIELLUM Strand

Arch. Math. Naturv. 24 (2): 31. 1901.

Type: *Erigone mirabilis* L. Koch.

This genus is characterized by having the anterior metatarsi distinctly sinuous and armed with numerous spines. The embolic division has the duct opening near the base of the tail-piece beyond which there is a very long, curved, sharp-pointed process. The epigynum is protuberant and is reminiscent of *Hilaira*.

#### *Utopiellum mirabile* L. Koch

(Figures 38-41)

*Erigone mirabilis* L. Koch, Kong. Sv. Vet-Akad. Handl. 15: 49, pl. 2, f. 4. 1879.

*Utopiellum mirabile* Strand, Arch. Math. Naturv. 24 (2): 31. 1901.

*Utopiellum mirabile* Strand, Fauna Arctica 4 (3): 449. 1916.

*Gongylidium curvitaris* Emerton, Can. Ent. 49: 262, fig. 14. 1917.

*Hilaira curvitaris* Emerton, Royal Can. Inst. Trans. 12: 316. 1919.

*Utopiellum curvitaris* Chamberlin, N. Y. Ent. Soc. Jour. 29: 40. 1921.

*Utopiellum mirabile* Holm, Kongl. Sven. Vetensk. Skrift. Natursk. No. 19: 5. 1931.

Male. Length, 3.3 mm. Cephalothorax dusky orange with lighter radiating lines; viewed from above rather broad, sides evenly rounded, convergent toward the front, broadly rounded in front; viewed from the side gradually ascending to the dorsal groove, nearly flat on top and then descending steeply through the eye region. The head is distinctly depressed in the eye region. Clypeus slightly convex and nearly vertical. Posterior eyes in a strongly procurved line, equal and equidistant, separated by a little more than the diameter. Anterior eyes in a very slightly recurved line, the median smaller than the lateral, separated from each other by the diameter and twice as far from the lateral. Clypeus about half as wide as the median ocular area.

Sternum and labium grayish over yellowish orange. Sternum broad and rounded on the sides, narrowly produced between the hind coxæ. Hind coxæ separated by less than half the diameter. Endites grayish yellow, lighter than the sternum. Legs and palpi yellowish. Anterior metatarsi distinctly sinuous, armed ventro-mesally with numerous black spines. No tooth on the face of the chelicera. Abdomen grayish with indistinct light areas, the middle ones in pairs; underside with the usual longitudinal light lines.

Femur of palpus rather short and stout, somewhat curved and widened distally. Patella short, stout, strongly curved ventrally. Ratio of length of femur to that of patella as 23 to 8. Tibia longer than patella, broad, with three long slender hairs near the ventro-lateral margin, the dorso-lateral apophysis triangular, broad at base, with a sharp black incurved tip. Base of

cymbium below tibial apophysis with a double row of short, stiff, black spines. Paracymbium large, triangular, armed on the outer angle with two very long slender spines and at the base with 11 short stiff hairs; the tip bluntly pointed and with a deep notch on the inner side. Subtegulum well developed, tegulum narrow. The embolic division consists of a large flattened sock-shaped tail-piece and a very large, curved, long and pointed terminal part. At the base the tail-piece on a large irregular protuberance lies the minute embolus. Near it there is another small pointed process.

Female. Length, 3.5 mm. Similar to the male in color. The head is not depressed in the eye region as in the male and the anterior metatarsi are normal. Epigynum strongly convex, protuberant, semitubular, tapering, truncate; the end is broadly and shallowly emarginate and the middle lobe shows as a broadly triangular truncate plate.

Type locality: Werschinskoj (lat. 68° 45') Jenissej River, Siberia.

New York: Mt. Whiteface, 4000 ft. Aug. 28, 1916, 1 ♂ 1 ♀, in moss in spruce forest (from the same lot as the type); Sept. 13, 1931, 1 ♂ 1 ♀ (Hammer); Artist's Brook, Chapel Pond, Essex Co., Aug. 24, 1930, 1 ♂ 4 ♀; Sept. 7, 1931, 5 ♂ 7 ♀, sifted from moss on the rocks where the temperature remains low all summer from the ice beneath the talus slope. Mt. Marcy, Aug. 27, 1930, 2 ♀. Mature specimens are abundant late in the season. On Oct. 20, 1934, we collected 5 ♀s at Chapel Pond and on Oct. 21, 9 ♂s and 29 ♀s near the summit of Mt. Whiteface, N. Y.

We have compared specimens from New York with a male from Abisko National Park, Sweden, kindly sent us by Mr. A. Holm, and find them to be identical.

This species has also been recorded by Emerton from Alberta: Sulfur Mt., Banff, April on snow.

#### DIPLOCEPHALUS Bertkau

Naturh. Ver. Preuss. Rheinl. 40: 228. 1883.

Type: *Erigone foraminifer* Cambridge.

We have not been able to study specimens of the type species,

*foraminifer*, but there is very little doubt that it is strictly congeneric with *cristatus* described below.

**Diplocephalus cristatus** Blackwall

(Figures 42-43)

*Walckenaera cristata* Blackwall, Lond. Edinb. Phil. Mag. ser. 3, 3: 107. 1833.

*Theridion bicornis* Wider, Reuss, Zool. Misc. Ar. p. 214, pl. 14, f. 12. 1834.

*Walckenaera cristata* Blackwall, Res. Zool. p. 317, pl. 2, f. 7-10. 1834.

*Micryphantes caespitum* C. L. Koch, Uebers. Ar. Syst. 1: 12. 1837.

*Micryphantes caespitum* C. L. Koch, Die Arach. 8: 104, f. 673-674. 1841

*Argus bicornis* Walckenaer, Ins. Apt. 2: 365. 1841.

*Micryphantes caespitum* C. L. Koch, Uebers. Ar. Syst. 5: 19. 1850.

*Erigone bicornis* Westring, Göteb. Vet. Hdl. 2: 41. 1851.

*Walckenaera cristata* Blackwall, An. Mag. Nat. Hist. ser. 2, 9: 465. 1852.

*Erigone bicornis* Westring, Ar. Suec., p. 216. 1861.

*Walckenaera cristata* Blackwall, Spid. Gt. Brit., p. 309, pl. 21, f. 224. 1864.

*Melicertus bicornis* Simon, Hist. Nat. Ar., p. 196. 1864.

*Micryphantes caespitum* Ohlert, Ar. Prov. Preuss., pp. 54, 60. 1867.

*Lophomma bicornis* Menge, Preuss. Spinn. p. 212, pl. 42, f. 111. 1868.

*Erigone cristata* Thorell, Rem. Syn. p. 108. 1871.

*Lophomma cristata* Karsch, Naturh. Ver. Rheinl. Verh. 30: 132. 1873.

*Erigone bicornis* Lebert, Soc. Helv. Sc. Nat. Nouv. Mem. 27 (2): 190. 1877.

*Walckenaera cristata* Cambridge, Spid. Dorset, p. 152. 1879-81.

*Lophomma cristata* Emerton, Conn. Acad. Sci. Trans. 6: 44, pl. 10, f. 1. 1882.

*Prosoponcus cristatus* Simon, Ar. Fr. 5: 570, f. 380-381. 1884.

*Walckenaera cristata* Dahl, Naturw. Ver. Schles.-Holst. Schriften 6: 84. 1886.

*Diplocephalus cristatus* Chyzer & Kulezynski, Ar. Hung. 2: 109, pl. 4, f. 22. 1894.

*Diplocephalus cristatus* Müller & Schenkel, Naturf. Ges. Basel Verh. 10: 733. 1895.

*Lophomma cristata* Banks, Phila. Ac. Nat. Sci. Proc. p. 35. 1892. (Probably not this species, ♀ only.)

*Diplocephalus cristatus* de Lessert, Rev. Suisse Zool. 12: 317. 1904.

*Diplocephalus cristatus* Crosby, Phila. Ac. Nat. Sci. Proc. p. 304. 1905.

*Diplocephalus cristatus* de Lessert, Cat. Ar. Suisse, p. 148. 1910.

*Diplocephalus cristatus* Simon, Ar. Fr. 6: 376. 1926.

Male. Length, 2.2 mm. Cephalothorax yellowish brown; viewed from above, rather elongate, rounded on the sides posteriorly, converging toward the front, bluntly pointed in front. Viewed from the side, steeply ascending behind in a straight line, nearly level on the back and then concavely ascending to the posterior median eyes, the head elevated and divided into two small lobes separated by a shallow notch. Clypeus very wide, broadly concave, and somewhat retreating. Sternum dark, nearly black. Endites orange-yellow, lighter at tip. Chelicerae rather large, slightly divergent. Legs and palpi orange-yellow. Abdomen dark gray.

Posterior eyes in a very slightly recurved line, the median slightly smaller than the lateral, separated by the diameter and from the lateral by twice the diameter. Anterior eyes in a very strongly procurved line, the median much smaller than the lateral, separated by a little less than the diameter and from the lateral by five times the diameter. Femur of palpus rather stout, thicker distally, and armed below with a row of six or seven small hairs. Patella rather long, thicker distally, armed dorsally near the margin, with an erect stiff spine. Ratio of length of femur to that of patella as 16 to 8.

Tibia rather slender at base, then strongly widened and produced forward to broadly cover the basal half of the cymbium. The lateral margin of this lobe is deeply convex toward the tip,



in the middle part it is broadly rounded and armed just back of the margin with a row of 6 or 7 stiff hairs. At base it is deeply notched for the reception of the constricted part of the paracymbium. The distal margin of the lobe broadly rounded and armed on the mesal angle with a strong pointed process directed laterally and lying nearly parallel with the distal margin. The mesal margin gently concave. Tibia with a distinct quadrate protuberance below.

The embolic division has the tail-piece long, nearly straight, broader and rounded at tip, which extends to the edge of the cymbium. Attached to its base is a rather stout enlargement which bears apically a long, stout, pointed process. Basally the margin of this enlargement is expanded into a thin, undulating flange in the edge of which the duct opens. The median apophysis is developed into a very long, branched process which curves around on the ventral side of the bulb inside the bezel and outside of the tail-piece and ends in two sharp points. There is also a sharp tooth on the ventral-lateral side.

Female. Length, 1.9. Similar to the male in form and color; head normal. Posterior eyes in a straight line, equal, the median separated by a little less than the diameter and a little nearer to the lateral. Anterior eyes in a straight line, the median smaller than the lateral, separated by the radius and from the lateral by three-fourths the diameter. The epigynum consists of a convex plate, divided medially by a groove narrow in front with the sides parallel and inclined to form a triangular opening behind which is occupied by the middle lobe.

England: Warwickshire, 4 ♂, 1 ♀ (Richard Hancock).

Hungary: 1 ♂, 1 ♀ (Kulezynski).

Ontario: Toronto, April 5, 1934, 2 ♂ (Dymond).

Massachusetts: Allston, Nov. 9, 1905, 1 ♂, 1 ♀ (Bryant).

*(To be continued)*